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Corn breeders stalk perfect hybrid

Researchers wager future on high-tech genetic process

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MOUNT VERNON, Iowa — The attention of the plant-breeding world is focused this summer on some 90 corn plants growing in an unmarked experimental plot south of here.

The plants in the field are short and a little spindly. It's a good bet these plants, of an experiment by a small biotechnology company, BioTechnica International Inc., won't win any yield contests.

But they may well be the launching point or a genetic engineering revolution that experts say could change much of what is known about corn, the king crop of American agriculture.

BioTechnica, based in Massachusetts, announced a breakthrough in corn gene splicing early this year. DEKALB Genetics Inc. and Monsanto Co. followed in April and Pioneer Hi-Bred International Inc., the seed corn industry leader, says it is also working on a high-tech corn breeding process.

All of the companies are betting millions of research dollars they can employ the gene-splicing process to custom-design corn varieties to match the needs of the farmer and the ultimate user of the grain.

For example, scientists for the corn seed companies predict they will be able to develop corn that resists insects naturally, so pesticides would be unnecessary.

They also are looking for genetic material that would add protein or other nutritional attributes to corn, making the grain a boon to livestock feeders. They also think they

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can splice in other traits, like extra starch or oil, so that food processors or industrial corn users would pay farmers a premium price for it.

The companies predict the improved seeds will be available to farmers sometime after 1995.

If they are right, corn-breeding and marketing experts say it would change the way farmers choose corn seed to plant each spring. It would radically alter the way farmers market their fall harvests, they say. And ultimately it could change the way corn is used in livestock feeding, consumer foods and industrial products, such as ethanol or plastics.

“A lot of things are going to happen to corn because of this,” predicts Phillip Baumel, a grain marketing economics professor at Iowa State University.

Unlike hybrids, which changed the way corn was grown, genetic engineering technology is likely to have a big impact on the way the crop is marketed.

That system probably will have to be revamped if farmers begin growing custom-designed corn in a big way, Baumel said.

For custom-designed corn to be economi-

cally viable in the marketplace, it must be kept separate. For example, high protein corn bound for livestock feeders would lose value when mixed with corn containing extra starch for sweetener makers.

“There is going to be some splintering in the market, with certain niches developing,” Baumel said.

One obvious niche is the livestock market, said Roger Kleese, president of Plant Science Research Inc., a subsidiary of BioTechnica. “We think there is a big market for corn that has improved nutritional value.”

By splicing in a gene to give corn more protein or other attributes, the grain would be valuable to livestock feeders because their animals would fatten more efficiently without additives, Kleese said.

But there would be big changes for farmers who market their corn to large poultry raisers in the South or to the sprawling Great Plains cattle feedlots, Baumel said.

That could mean more grain will be stored on farms instead of in the local grain elevator, where grain from the entire area is normally mixed, Baumel said. And groups of farmers, or grain companies, may develop systems of loading entire trains of the improved corn to be hauled to large poultry or cattle raisers.